

REMARKS/ARGUMENTS

Claims 22-31 are pending in the present application. Claims 22-31 have been rejected.

Claims 22-26 and 28-31 have been rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,788,510 to Walker. Claim 27 has been rejected under 35 U.S.C. §103(a) as being unpatentable over Walker. It is respectfully submitted that claims 22-31 are allowable over the art of record for the reasons set forth below.

Claims 22 and 28 include features that are neither disclosed nor suggested by Walker, namely:

Claim 22

An electrical connector, comprising:

a housing including a peripheral wall surrounding and rising above an array of contact receiving passageways and having a perimeter edge;

a plurality of separate surface mount contacts for connecting said housing to a substrate by a reflow process employing heat; and

areas of reduced rigidity in portions of said peripheral wall of the housing at which stress builds up due to the heat of the reflow process, each of the areas of reduced rigidity comprising portions of removed housing extending substantially perpendicular to a surface of the housing and extending through a distal end of said peripheral wall of the housing from an inner face to an outer face of the peripheral wall;

such that said areas of reduced rigidity contribute to said plurality of separate surface mount contacts better retaining their co-planarity during and after the reflow process. (emphasis added)

Claim 28

A method of reducing rigidity in a housing of an electrical connector having a plurality of separate surface mount contacts, comprising:

determining a location on said housing which may build up stress during a reflow process employing heat in which the plurality of separate surface mount contacts connect said housing to a substrate; and

removing a portion of the housing extending substantially perpendicular to a surface of the housing at said location. (emphasis added)

The present invention is directed to a connector that exhibits high co-planarity along the mounting interface by providing a connector housing in which stress buildup (and thus warpage and deformation) is avoided. The present invention avoids stress buildup during a reflow process employing heat, by providing a connector housing that has portions of housing removed at the areas where the stress buildup is expected. This minimizes warping and

twisting of the housing during a reflow process employing heat.

The Office Action acknowledges that Walker is silent “about the reduced rigidity area at which stress is built up for preventing warpage problem of the housing” (Office Action, page 2, section 2). The Office Action then states, however, that this feature is inherent because “a means of the removed portion of the peripheral wall is disclosed, and it is apparent that some type of warpage prevention must be presented in order for the device to function as intended” (Office Action, page 2, section 2).

It is respectfully submitted that the areas of reduced rigidity in Walker do not inherently avoid stress buildup during a reflow process employing heat, as defined by the claims. The Examiner labels a portion of Figure 1 in Walker as “E1”, and equates this E1 with areas of reduced rigidity. However, the reason the Examiner has to label the area of Walker “E1” is because Walker himself does not label it anything -- seemingly reducing this feature to some kind of insignificant triviality. Indeed, in actuality, Walker does not specifically disclose anything about the E1 area, and is absolutely silent to why it is there and what purpose it serves. Walker’s E1 area is certainly not there to prevent warpage during a reflow process as required by the present claims because as a through-hole connector, Walker’s connector would not go through the heat history and heat profile associated with a reflow process.

Moreover, Walker is unrelated to a connector that is involved in a reflow process employing heat. Walker is a completely different type of connector faced with completely different issues. Walker is a through-hole connector as indicated by solder tails 76. Co-planarity is not critical in such a connector because of the larger electrical contact surfaces of solder tails 76. Accordingly, even if somehow through some type of heating, Walker’s housing was warped, etc., the warpage’s effect on electrical performance might completely go unnoticed due to the fact that the long solder tails 76 can take up the slack of dimensional imperfections. Thus, no one skilled in the art would know that Walker’s E1 area cure a warpage problem because there would be no electrical evidence of a warpage problem in the first place.

The Examiner states that Walker’s E1 area would inherently have the Applicant’s claimed feature. This is a flawed statement. There is absolutely nothing in Walker to support that conclusion. Indeed, area E1 can be a manifestation of the manufacturing of the part, i.e.,

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positioning tool placement. The absolute silence of Walker places too many doubts as to the "teaching".

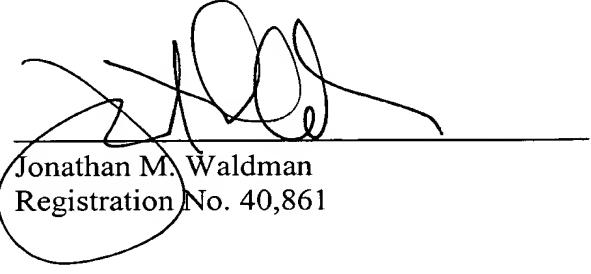
On the other hand, Applicant claims a specific location for their area of reduced rigidity. In claim 22, for example, the areas of reduced rigidity are located where it is known that stress will build up due to the heat of the reflow process and the materials from which the connector housing are made. Such locations can be easily predicted by modeling as well as testing and are then predetermined.

Based on the foregoing, claims 22 and 28 should not be rejected as being anticipated by Walker. Thus, claims 22 and 28 are patentable for the reasons set forth above.

Claims 23-27 depend on claim 22, and claims 29-31 depend on claim 28. Thus, claims 23-27 and 29-31 are patentable for the reasons set forth above. Withdrawal of the rejections of claims 22-26 and 28-31 under 35 U.S.C. §102(b), and of claim 27 under 35 U.S.C. §103(a), is respectfully requested.

In view of the foregoing remarks, Applicants submit that the above-identified application is in condition for allowance. Early notification to this effect is respectfully requested.

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